

**REMARKS**

Claims 1, 3, 4, 6 through 10, 12 through 19, and 21 through 25 are pending in the application.

Claims 1 and 25 have been amended to reflect advantageous food casings formed from amide polymer consisting of copolyamide including nylon 6/66 and/or nylon 6/12. Support for this amendment can be found in the Application-as-filed, for example on Page 5, line 30 through Page 6, line 2.

Claims 1 and 25 have also been amended to expressly recite the potential incorporation of polyether block amides. Support for this amendment can be found in the Application-as-filed, for example on Page 5, line 30 through Page 6, line 3.

Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

**Section 112 Rejection**

Claim 24 stands rejected over the recitation "other than polyvinylpyrrolidone." As correctly noted by the Examiner, the Application-as-filed notes that the water soluble polymer can include polyvinylpyrrolidone ("PVP"). The term "can" is defined as "to be able to;" "to be potentially capable of," or "be permitted to."<sup>1</sup> Hence the term "can" indicates a component whose presence is permitted, but not required. In fact, the Working Example within the Application-as-filed does not incorporate PVP, as indicated on Page 8, lines 5 through 17. Claim 24 is intended to reflect such embodiments in which PVP is not required. Applicants further respectfully submit that there is no requirement under United States practice of "in ipso verbis." Accordingly, Applicants respectfully request withdrawal of the foregoing rejection.

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<sup>1</sup> *The Oxford American Desk Dictionary and Thesaurus* (2<sup>nd</sup> Ed, 2001).

Claim 23 stands rejected over a lack of antecedent basis for the term “polyether block amide.” Claim 1, upon which Claim 23 depends, has been amended to provide antecedent basis for the foregoing term. Accordingly, Applicants respectfully request withdrawal of the foregoing rejection.

*The Claimed Invention is Patentable  
in Light of the Art of Record*

Claims 1, 3, 4, 6 through 10, 12 through 19 and 21 through 25 stand rejected in light of United States Patent No. 7,001,635 (“US 635”) to Merritt et al. in view of United States Patent No. 5,773,059 (“US 059”) to Delius et al.; United States Patent No. 6,203,750 (“US 750”) to Ahlgren et al. and United States Patent No. 5,399,427 (“US 427”) to Stenger.

Applicants respectfully note with gratitude the Examiner’s indication within the outstanding Office Action on Page 2, Ref. No. 2 that the claims as-amended are considered patentable in light of the combination of US 635, JP 059, US 750 and US 834. Accordingly, the remarks which follow will emphasize the distinguishing features of newly cited US 059 and US 427.

It may be useful to briefly consider the invention before addressing the merits of the rejection.

Applicants respectfully reiterate that food casings, especially sausage casings, are predominantly offered in shirred form. Cellulose-based shirred casings, such as those disclosed in US 635, are known. Shirred sticks formed from synthetic polymers are also known; however, such shirred sticks are generally not very stable without net-type or reinforcing packaging, and are thus not in widespread use. Heretofore known synthetic polymer-based casings exhibit a relatively high resilience, resulting in the re-expansion of the shirred stick and associated pleat loss. (In that regard, the Examiner’s attention is kindly directed to the Application-as-filed on Page 2, lines 1 through 14, as well as US 834, Para. 0016, fifth sentence).

In addition to shirred pleat stability, polymer-based food casings should advantageously provide a balance of additional properties, including only modest bending of the shirred tube (thereby avoiding the conventional external reinforcement) and acceptable water vapor permeability.

Unexpectedly, Applicants have found synthetic polymer blends that may be used to form food casings exhibiting a heretofore unknown balance of beneficial properties, including shirred stick stability, advantageous tensile properties and water vapor permeability.

Applicants have more particularly found that food casings formed from a particular blend of polymers that includes aliphatic copolyamide and at least one further polymer selected from the group consisting of ionomers, ethylene/(meth)acrylic acid esters, polyurethanes, copolyesters, biodegradable polyesters, and water-soluble polymer provides a highly advantageous balance of adequate stiffness, shirr stability and water vapor permeability, as recited in the claims as-amended.

Specifically, Applicants have found that polymer blends including (i) amide polymer consisting of aliphatic copolyamide that includes nylon 6/6 and/or nylon 6/12 and (ii) at least one further polymer selected from the group consisting of ionomers, ethylene/(meth)acrylic acid esters, polyurethanes, copolyesters, biodegradable polyesters, and water-soluble polymer can be used to form intrinsically stable shirred food casings that bend under the effect of their own weight by no more than 20 % and exhibits a water vapor permeability of 20 to 1000 g/m<sup>2</sup> d, as recited in the claimed invention.

Applicants further respectfully reiterate that the inventive food casings may further advantageously be compressed to a ratio of 100:1 or more, as additionally recited in the claimed invention. In contrast, conventional casings, such as cellulose-based casings, are typically shirred at much lower compression ratios, such as a 70:1 ratio. In that regard, the Examiner's attention is kindly directed to the Application-as-filed on Page 8, lines 28 through 31. The elevated inventive compression ratios result in a higher number of casings per shirred stick, reducing operating costs for both the casing manufacturer and the downstream sausage producer.

In especially advantageous embodiments, the inventive shirred casing further comprises at least one of (i) an outer coating of oil or water and (ii) an outer surface tension of 40 to 50 mN/m imparted by corona treatment and said shirred casing extends in the longitudinal direction by no more than 10% when it is stored on a smooth, planar support, without packaging, at room temperature and 60 % relative humidity, as recited in Claim 22.

The cited references do not teach or suggest the claimed invention. Applicants specifically respectfully submit that newly cited US 059 and US 427 do not cure the deficiencies within the earlier cited references.

US 059 is directed to casings from a polyamide blend containing a minimum of 50 % nylon-6 polyamide. (Col. 2, lines 50 – 60). US 059 initially indicates that polymer selection greatly affects the resulting casing. (Col. 2, lines 16 – 29, noting the detrimental effects of polyester). US 059 goes on to teach the incorporation of long chain copolyamides into nylon-6 polyamide to form casings that are sufficiently supple for manual filling, which US 059 indicates is performed at a pressure lower than mechanical stuffing. (Col. 2, lines 53 – 67 and Col. 5, lines 47 - 50). The polyamide blends of US 059 may further include an optional aromatic copolyamide and/or carboxyl modified polyolefin. (Col. 3, lines 2 – 9). US 059 indicates that its casings encloses scalded sausages “significantly more tightly” than a casing made entirely of nylon 6 polyamide. (Col. 4, lines 49 – 54). US 059 generically notes that its casings may be “shirred in sections.” (Col. 6, lines 3 – 4). The Working Examples of US 059 generally include an aromatic nylon, along with up to 80 parts by weight nylon 6 polyamide. (Col. 6, line 30 – Col. 7, line 35).

US 059, requiring nylon 6 polyamide, does not teach or suggest advantageous food casings formed from amide polymer consisting of aliphatic copolyamide, much less nylon 6/66 and/or nylon 6/12 copolyamide, as recited in Claims 1 and 25 as-amended. Applicants further respectfully respectfully submit that alter US 059 so as to avoid its required nylon 6 would altogether change its principle of operation, hence its combination with the remaining art of record is improper. Applicants respectfully submit that there further would have been no motivation to have excluded the required nylon 6 from US 059 as there would have been no

expectation of success.

Nor does US 059 teach or suggest that inventive food casings excluding polyamides such as nylon 6, would, without separate support, exhibit sufficient intrinsic stability to be processed on fully automatic stuffing machines, as recited in Claims 1 and 25. US 059 instead suggest that its nylon 6 imparts the rigidity required for automatic stuffing machines.

US 059 thus can not teach or suggest that the inventive shirred food casings would bend under the effect of its own weight by no more than 20 % in the absence of polyamide, as further recited in Claims 1 and 25. US 059 instead teaches away from the inventive casings by suggesting that nylon-6-free casings would be overly supple.

And US 059, merely generically noting shirring, most certainly does not teach or suggest the inventive food casings further comprising at least one of (i) an outer coating of oil or water and (ii) an outer surface tension of 40 to 50 mN/m imparted by corona treatment would extend in the longitudinal direction by no more than 10% when it is stored on a smooth, planar support, without packaging, at room temperature and 60 % relative humidity, as recited in Claim 22.

US 059, directed solely to a polyamide blend, likewise fails to teach or suggest casings formed from a mixture of a single copolyamide, much less a single copolyamide combined with polyether block amide and partially or completely saponified polyvinylacetate, as recited in Claim 23.

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 059, considered either alone or in combination with the remaining art of record.

US 427 is likewise directed to a blend of amide polymers used to form low-shrink food casings that have an improved barrier to UV light and “high constancy in stretching.” (Col. 2, lines 49 – 51). US 427 indicates that casings incorporating copolyamide blends containing nylon 6/12 or nylon 6/66 suffer from unsteady stretching behavior. (Col. 2, lines 12 – 30). The casings of US 427 are formed from a mixture of polyamide and a partially aromatic copolyamide that

further includes a pigment having a particle size of from about 0.01 to about 15 microns. (Col. 3, lines 24 – 33). The casings of US 427 include up to 89.5 % linear polyamide and up to 50 % of aromatic co-polyamide. (Col. 4, lines 3 – 5 and Col. 4, lines 34 - 36). The casings of US 427 additionally include up to 5 % by weight pigment. (Col. 5, lines 8 – 10). US 427 indicates nylon 6, nylon 11 and nylon 12 to be very advantageous polyamides. (Col. 3, line 67 – Col. 4, line 2). Suitable aromatic groups include isophthalic acid and terephthalic acid. (Col. 4, lines 27 – 28). US 427 is altogether silent as to shirring.

US 427, requiring both polyamide and aromatic copolyamide, does not teach or suggest advantageous food casings formed from amide polymer consisting of aliphatic copolyamide, much less nylon 6/66 and/or nylon 6/12 copolyamide, as recited in Claims 1 and 25 as-amended. Applicants further respectfully respectfully submit that alter US 427 so as to avoid its required polyamide and aromatic copolyamide would altogether change its principle of operation, hence its combination with the remaining art of record is improper.

Nor does US 427 teach or suggest that inventive food casings excluding polyamide and aromatic copolyamide, would, without separate support, exhibit sufficient intrinsic stability to be processed on fully automatic stuffing machines, as recited in Claims 1 and 25.

US 427 thus can not teach or suggest that the inventive shirred food casings would bend under the effect of its own weight by no more than 20 % in the absence of polyamide and aromatic copolyamide, as further reflected in Claims 1 and 25.

And US 427, altogether silent as to shirring, most certainly does not teach or suggest the inventive food casings further comprising at least one of (i) an outer coating of oil or water and (ii) an outer surface tension of 40 to 50 mN/m imparted by corona treatment would extend in the longitudinal direction by no more than 10% when it is stored on a smooth, planar support, without packaging, at room temperature and 60 % relative humidity, as recited in Claim 22.

US 427, directed solely to a polyamide blend, similarly fails to teach or suggest casings formed from a mixture of a single copolyamide, much less a single copolyamide combined with polyether block amide and partially or completely saponified polyvinylacetate, as recited in Claim 23.

Accordingly, Applicants respectfully submit that the claimed invention is likewise patentable in light of US 427, considered either alone or in combination with the remaining art of record.

Applicants respectfully submit that the previously cited references likewise fail to teach or suggest the claimed invention.

Applicants respectfully reiterate that US 635 is generally directed to cellulosic casings containing liquid smoke that provide an enhanced smoky color and flavor to foods via an alkaline treatment. (Col. 1, lines 6 through 10 and Col. 6, lines 9 through 24). US 635 merely generically notes that casings formed from polymeric materials may be used within its invention. (Col. 6, lines 55 – 57). US 635 applies the liquid smoke prior to or during shirring. (Col. 8, lines 27 – 34). In contrast to the inventive intrinsically stable shirred casings, US 635 further expressly teaches that its casings are treated on the inside with a shirring solution to form self-sustaining sticks that “have sufficient coherency to hold together immediately after shirring through shipping and ultimate use.” (Col. 7, lines 10 – 12 and Col. 8, line 67 – Col. 9, line 5). The shirring solution used to form the working examples of US 635 incorporates carboxymethyl cellulose. (Col. 11, lines 24 – 43).

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 635, considered either alone or in combination with the remaining art of record.

Applicants respectfully reiterate that US 750 is directed to multilayered heat shrinkable casings suitable for cook-in use. (Col. 2, lines 5 – 7). The films of US 750 include a layer having a mixture of at least two polyamides having differing crystalline structures, which is said to allow orientation via hot water or steam. (Col. 2, lines 17 – 29; Col. 5, lines 1 – 5, and Col.

16, lines 10 - 18). US 750 specifically indicates that its impetus is that a layer of “predominantly nylon 6” can be readily oriented by adding a “secondary” polyamide. (Col. 16, lines 10 – 18). The films of US 750 further include polyolefin layer(s). (Col. 2, lines 8 – 11). In fact, the films of US 750 can incorporate up to 7 layers, including a polyvinylidene chloride barrier layer. (Col. 4, lines 44 – 45). The multilayered films of US 750 may be partially or completely crosslinked. (Col. 3, lines 46 – 51). US 750 indicates compression ratios of 40:1 as acceptable, noting that the compression ratio may be “even greater.” (Col. 14, lines 58 – 63). US 750 merely generically notes that various of its working examples were “shirred.” (Col. 19, lines 46 – 47 and Col. 20, lines 20 – 21). US 750 further notes that the shirred casing may be sheathed inside “a retaining sleeve.” (Col. 13, lines 27 – 28).

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 750, considered either alone or in combination with the remaining art of record.

Applicants respectfully submit that there likewise would have been no motivation to have combined the cited references. US 635 is directed to alkaline treatments for liquid-smoke-transfer casings. US 059 is directed to casings formed from a nylon-6 blend that are sufficiently supple for manual filling. US 750 is directed to films formed from a mixture of polyamides that may be oriented using hot water or steam. US 427 is directed to casings formed from a polyamide blend that have an improved barrier to UV light and high constancy in stretching. These are altogether different issues, to say the least.

However, even if Applicants had combined US 635, US 059, US 750 and US 427 (which they did not) the present invention would not have resulted.

US 750, directed to altogether different polymer blends and casing constructions, indicates that compression ratios as low as 40:1 are acceptable, and further notes use of a retaining sleeve. US 635 expressly teaches shirring solutions to form self-sustaining sticks. US 059 merely generically notes shirring, while US 427 is silent as to shirring.



The combination further does not teach or suggest advantageous food casings formed from amide polymer consisting of aliphatic copolyamide, much less nylon 6/66 and/or nylon 6/12 copolyamide, as recited in Claims 1 and 25 as-amended. Applicants further respectfully reiterate that to alter US 059 so as to avoid its required nylon 6 or alter US 427 so as to avoid its required polyamide and aromatic copolyamide would altogether change their principle of operation, hence their combination with the remaining art of record is improper. Similarly, to alter previously cited US 750 so as to avoid its polyamide (i.e. “predominantly nylon 6”) would altogether change its principle of operation, as well.

Nor does the combination teach or suggest that inventive food casings excluding polymides such as nylon 6, would, without separate support, exhibit sufficient intrinsic stability to be processed on fully automatic stuffing machines, as recited in Claims 1 and 25. US 059 instead suggests that its nylon 6 imparts the rigidity required for automatic stuffing machines. The remainder of the cited references do not cure this deficiency. In fact, US 750 expressly teaches retaining sleeves to impart shirring stability. Applicants further respectfully submit that the recited intrinsic stability and bending properties are physical properties imparted by or arising from the particular inventive polymeric selection within the claimed invention. Thus the durability of the cellulose or generic “polyamide” casings of US 635 may not be imputed to the recited at least binary co-polyamide composition, in contrast to the apparent urgings within the outstanding Office Action on Page 5, second and third full paragraphs.

Furthermore, US 635 expressly indicates that coatings applied to the casing are used to form shirred sticks “which have sufficient coherency to hold together from immediately after shirring through shipping and ultimate use.” (US 635, Col. 8, line 67 – Col. 9, line 7). In contrast, the recited polymer compositions impart intrinsic shirr stability within the claimed casings, i.e. the inventive food casings are shirr stable without a shirr coating.

The combination thus can not teach or suggest that the inventive shirred food casings would bend under the effect of its own weight by no more than 20% in the absence of polyamide, as further recited in Claims 1 and 25. US 059 instead teaches away from the inventive casings by suggesting that nylon-6-free casings would be overly supple. The remainder of the cited references likewise fail to cure this deficiency.

And the combination most certainly does not teach or suggest the inventive food casings further comprising at least one of (i) an outer coating of oil or water and (ii) an outer surface tension of 40 to 50 mN/m imparted by corona treatment would extend in the longitudinal direction by no more than 10% when it is stored on a smooth, planar support, without packaging, at room temperature and 60 % relative humidity, as recited in Claim 22.

Nor does the combination teach or suggest casings formed from a mixture of a single copolyamide, much less a single copolyamide combined with polyether block amide and partially or completely saponified polyvinyl acetate, as recited in Claim 23. Each of US 059, US 427 and US 750 require specific amide polymer blends, while US 635 merely generically notes the formation of casings from "plastics or polyamides."

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 635, US 059, US 750 and US 427, considered either alone or in any combination.

### **CONCLUSION**

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1, 3, 4, 6 through 10, 12 through 19, and 21 through 25 are now in condition for immediate allowance. It is requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.

Respectfully submitted,

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